D R A F T

16 March 1966

MEMORANDUM FOR THE RECORD

SUBJECT: Meeting with [ ] REpresentatives on 16 March Regarding Modulated Light Direct Film Viewer

Attendees: [ ]

1. [ ] opened the meeting by explaining to the [ ] representatives that he had generated an internal memorandum which he would verbaly communicate to them. This memorandum discusses P&DS relationship to this program from a technical standpoint. In this memorandum we reference three papers provided us by [ ] The original proposal (1964), [ ] minutes of presentation regarding subject on 6 Jan. 1966, and [ ] letter regarding subject viewer dated 1 March 1966. [ ] then explained to the [ ] representatives that P&DS is asking [ ] to resubmit their proposal. He stated further that in this new proposal anything stated in [ ] earlier proposal which [ ] takes exception to should be so stated in their new proposal. Otherwise [ ] will be expected to comply with the statements put forth in the former proposals.

[ ] asked if [ ] would call out what he wanted defined, and he continued saying he understood that the third document was a new proposal.

[ ] stated that he felt it was quite important for [ ] to know what areas need definition, otherwise it might be overlooked.

[ ] stated that if [ ] doesn't take exception to it you intend to comply with it , it wouldn't be overlooked.

[ ] stated that many things need more explanation such as: properties of phosphor, birghtness in the system, number of frames per second, spot size, etc. [illegible] more clearly defined and there are any number of

properties described.

25X1 [redacted] - these things you are speaking of are goals that would be examined as a part of the study.

25X1 [redacted] asked if the ~~xxxxxxx~~ new specifications were comprehensive.

25X1 [redacted] replied that they were not comprehensive. [redacted] 25X1 continued saying he expected the same treatment with the minutes [redacted] 25X1 gave P&DS of the 6 January meeting. All pertaining as ~~x~~ valid performance figures ~~xx~~ unless you state otherwise.

25X1 [redacted] said that the second and third documents were more up to date than the first.

25X1 [redacted] - All three documents are pertinent to us.

25X1 [redacted] asked if there were any contridictions between the three documents.

25X1 [redacted] - call them what you wish = changes or contridictions. They are not the same - need a statement of compatibility.

25X1 [redacted] stated that ~~xxxx~~ when [redacted] delivers the new proposal a cost ~~xx~~ 25X1 estimate should be included. P&DS is not obligated beyond the original contract price unless new specifications are met.

25X1 [redacted]

25X1 [redacted] - Tear does not read it ~~xxxx~~ that way.

25X1 [redacted] - nail down specific goals that must be on a fixed price contract in meeting these goals.

25X1 [redacted] - there will be some negotiable aspects on the thing. you must provide the specifications.

25X1 [redacted] - ~~xxxxxxxxxxxxxxxx~~ Are we talking about fixed price or ceiling price?

25X1 [redacted] - ~~xxxx~~ Ceiling price.

25X1 [redacted] - The letter we ~~x~~ sent you was ~~xxxxx~~ signed by the Manger

25X1 of the [redacted] and it is his intention to honor it.

25X1 [redacted] (continued) I don't think that [redacted] is interested in converting 25X1 this from a CPAF to a fixed price contract.

25X1 [redacted] - Government is only interested in an arrangement in which it would be obligated only to the funds in the original contract unless new specifications are met.

25X1 [redacted] = We are talking about new funds. (to the [redacted] people) 25X1 In setting these goals how attainable are they? Depending on what these goals are that you want established, I am sure they can be attained some way or other. They are not beyond the state-of-the-art. If there is enough money available we can attain this.

25X1 [redacted] - We will be discussing specifications today.

25X1 [redacted] - Don't want you to spend the time to prepare a proposal if you cannot or are not willing to spell out the specifications you will meet.

25X1 [redacted] then asked [redacted] to explain the basic circuitry, logic 25X1 modules, etc.

25X1 [redacted] if he had a chance to look at the draft document which was in the loose leaf notebook given to you in January.

25X1 [redacted] - Yes I looked at it when I received it , but not recently.

25X1 [redacted] drew the circuitry on the blackboard and discussed its workings. Some of his comments were:

What we have for the direct viewing is the 6342A photo multiplier . A UV filter (?) that peaks at 305 mm. Another of the photo multiplier consists of the pre-amplifier, non-inverting type amplifier. Voltage comes out of the amplifier at the same ratio as goes in. Following that is an amplifier mounted in the housing giving us a slight increase in gain. Overall system has a gain of 10. The transferred gain comes out of the photo multiplier.

Basically what we have in the output (?) of the gain control for a _____

(?) feeds for DC level to drive the photo amplifier.

Power amplifier has differential for stability. Power amplifier is mounted on the kinescope. _____ drives the kinescope.

This is the one that gives our power.

The (this) particular circuit is our phsophor, has a (?) roll unit of which magnifier strives for a particular transfer function. This is bound to be the slowest part of the system.

Open loop. When the loop is closed you have gain control.

25X1 [redacted] What is the problem area you had when we saw the equipment.

The feedback circuit seemed _____

25X1 [redacted] The feed back system had a different pre-amplifier. It was not giving us enough gain to drive the (?) new axle capability.
(nu - ang u lar)

We wern't able to cut down on the high amplifier. We replaced that entire system and have gone to these amplifiers, and they are much better and are giving us what we want. Whe you switch from microscope to direct viewing you have a 931 photo multiplier instead of the 6342A. Simply because the house is made for the 931. The system is identical with the composition (?) that when we pace back(?) GI enlarger (?ranger) makes because of raster turn down.

We limit the kinescope to 1000 FL. The only other change is the additional gain in the kinescope pre-amplifier system.

25X1 [redacted] Back in January, several things were giving us trouble.
We

We had AC couples at that time.

You can plot summary of comparison (compensation?).

25X1 [redacted] - None of us represent a level of knowledge of electronics with you. Most of our knowledge is simply practical, learned from working with the equipment.

25X1 [redacted] continued asking = you mentioned the phospher (conductor?) contained on the _____ tube is not the same as on the P4/that were on the breadboard tube and has

25X1 [redacted] - They are somewhat different from the early tube. Problems that were in evidence in the breadboard we attributed to other characteristics (causes?), which should have been attributed to the phosphor. Since your requirements cite light intensity (instead?) of brightness. Tend to lessen (lenghten)/on/you in the (spread?) of the phospher that works in the pass (phase) and gains of the phospher.

Rate at which you are going to present the picture. Terns out for the phospher may be different from manufacturer to manufacturer. You have to loose one in the rate and one in the (flow?). Like 60 microseconds plus. 20 microseconds is much too slow. Kind of impasse. What happens is that we push far down in the spectrum. 2 - 3 microsecond gain.

Same as for the breadboard - UV kinescope. Have had to cut down on the optical gain on the whole system. Since the output of the kinescope is going to be ad_____. from out_____ in the photo multiplier. signal to noise ratio problems.

25X1 [redacted] How do you allow for your (used) saturation? over satisified.

25X1 [redacted] - It would as the film was moving faster , degree is 2 - 3 microseconds.

25X1 [redacted] switched pictured (occurred) of scale. How would you get the accompanied _____

Turn the gain way up. 1 foot per centimeter. 300 microsceond.

25X1 [redacted]

Dropped to about half - it would be much more than an order of magnitude. you are multiplying

25X1 [redacted] Particularly interested in the cause? characteristics of the phosphor. I recall that

subjective to the objective characteristics of the system. Do you feel that the solution you have attempted augmented? is related to the objectives of the system?

Spread of the phosphor and the energy available have you(r) feedback signal and apparently these are working against each other.

25X1 [redacted] - We did have a problem but I think it has been corrected. we are pleased with the compression we are attaining. Illumination will still be 30:1 ---- feedback by direct view is in good shape.

25X1 [redacted] - The way in which the contrasted compreshion is measured. inconsistency when we looked at the system. we felt that this was against the rulles of the game. Compare performance with the compression on to the other hand with the compression turned off.

25X1 [redacted] - Compression on or off, feed back system compressed on open. Some of the measurement

25X1 [redacted] -We Way in which we made the measurements was

25X1 agreed with [redacted] and documented in the January report.

25X1 [redacted] agreement in this instances may have been in ignorance. If upon this explanation we have made a blunder we want to correct it.

25X1 [redacted] - you had this switch = you were put this through the rest of the order.

When you turn it off, you just let the amplifier work without doing anything. When you switch you get (phase?) for your kinescope. this is opening the loop. The other way is just drop a black cloth (blanket) over the photo multiplier.

25X1 [redacted] -Should be something analogous to the way it would operate under working conditions.

Purpose is to device (a test) with properties(?) of the illumination over a sample of densities simultaneously. Compression _____ is to be (opened) at the time that the feedback is on.

25X1 [redacted] - Measure the light on the right(rate?)

25X1 [redacted] - The test procedure must be an evaluation comparable to operating conditions. We do not feel that the way of measure (ing) with the feedback on and off is sufficient.

25X1 [redacted] - I am sure that the was it is, is what you want but we have not explained it clearly. Opening the loop - same thing as opening the loop any other place.

25X1 [redacted] - Do it in a way that is representative to operating equipment and we will be agreeable to it. Turning it off or covering it completely is not the same in the

25X1 [redacted] Possibility now it was going through the raster as we opened the loop we were using a section on the kinescope to measure compression ratio _____ _____ part (put) on the scan used a piece of block material - check _____ where _____ _____ loop was opened 500 FL without _____ _____ to

25X1 [redacted] - related somewhat to the graphs you gave us would be analogous to operating system. Case in which you said a density shapes that you introduce _____ to a clear shape and you measure the brightness through the two shapes. you get something different to 30:1.

25X1 [redacted] - 30:1 up at the top of the kinescope output. 30:1 maximum brightness that can come through.

25X1 [redacted] - you want it high in the dark parts.

25X1 [redacted] - Over the past two months we have been operating with a misunderstanding of what contrasting compression is. This is not what is commonly referred to as contrast compression as a function of the variation in the _____ in the material. Displaying this attenuation does not mean that the contrast of a given sence is 33:1.

25X1 [redacted] It) either your one maintaining _____ that contrast ratio divided between two.
Given contrast ratio from one portion to the other. - should be _____ by 30:1 when the operating _____ frequency _____ no matter what density you are using.

25X1 [redacted] not constituted

25X1 [redacted] before any _____ intensities of 50 instead of 10 for a contrast ratio of 5 to 1, ~~and two~~ would this depress this ratio? _____ the brightness of.

25X1 [redacted] As soon as you make the one _____ with _____ corresponds to one without contrast --going to have contrast of 30:1.

25X1 [redacted] - I know that we cannot attain this _____ ment on a conventional photo. Define for us what range of the photographic density scale this will spread in and what are the contrast.

25X1 [redacted]- Suppose I take x 5:1 at about 80.

25X1 [redacted]- When you get to 20 it doesn't work.

25X1 [redacted] you can't make 5:1 convert themselves (?) _____ xx turn equal effort they come through the transparency. You reduce the differences by a contrast f of 30. An increment in brightness of 4. increments of 1/10 in the other gain.

25X1 [redacted]- Structure in photographic brightness isn't xfxxx often (goes) to a density of 2.0, density quite a bit greater than this.

25X1 [redacted]Do you want contrast maintained entire time?

[redacted]- Applicable (?) you cannot reduce comparison at both levels. Brightness as compared with compression. you have a fall off.

25X1 [redacted]- Supposedly multiplier in which _____ as you go down the light from the top xf you will have fall away.

25X1 [redacted]- You take care of by comparing _____.

[redacted]- That is right. Without modulation at 5% - 7 FL, when system is on - 4 FL coming xx in on us so fx fast. May be but the noise will come out.

25X1 [redacted]- We know there is something working xxx - LogEtronics.

25X1 [redacted]- Could you furnish x us with Log E curves?

25X1 [redacted]- Would like it to be in the form of a parallel. As xf it is limited to the xxxxxx asset performance - perfer that you put it on full logarithmic paper. Logarithm on both axes and in indicated (intricate) xxxxxxxxx intervals of 10% to 1%.

25X1 [redacted]

Feedback on and off. _____

25X1 [redacted]- demonstration of the equipment as it xx stands showed us difficulty in detecting areas of the darker spectrum.

25X1 [redacted] -continued - Would like to be able to attenuate darkness in the emulsion (?) The beneficial effects/were that documented were so subtle as to be unidentifable.

25X1 [redacted] - If we managed to put those curves on these dark areas we would not have a contrast compression taking place at all.

25X1 [redacted] - Where the curve/has fallen off there is a negative contrast.

25X1 [redacted] illumination.

25X1 [redacted] - No. There is a very noticable attenuation in the high light areas. Also when feedback system is on and assist turned up to high gain (?) there is quite _____ diminishing of illumination on the dark areas of the film. Dark on both the large and small rasters.

25X1 [redacted] - AC coupling would work better.

25X1 [redacted] - First of all when viewing of the _____ microscope meet(?) to the left. That system wasn't aligned to see much of anything. When the control leave(lever) control areas in density of monitors -- main reason to have the capability of high lighting compression of. level control and move back and forth.

25X1 [redacted] - The desirable goal we are looking for is a feed back procedure somewhat attenuated effects but beneficial (sound) turned in the dimmer areas of film.

Logrithmic paper on both axes and data performance of the system will be . But we can not do this in terms of turning the feed back circuit on and off. Would have to be with a clear film to a film on known density.

25X1 [redacted] can make this computation. Could make that computation from data that is available.

25X1 [redacted] - It would be desirable to doing may work. Should finish it first.

25X1 [redacted] Commit yourselves to a specification that you are sure you can meet.

25X1 [redacted] - Can be extended upward - that means with the falling off at 10 intermission (intervals) of the field. Three times brightness to achieve three percent.

25X1 [redacted] said he was particularly interested in the phosphor. He said he had a definite impression of a lack of data for it at that time.

25X1 [redacted] Have beed back system - don't have delays in the system. That 's when funny edges come in. Design the feed back system, the phosphor is _____ you will block item(?) gain characteristics.

25X1 [redacted] - Design the electrical block so that you do get phosphor , so that you don't get the funny edges. Phosphor is the slow response - is too slow feed back compression. DV gain phase mechanism so that system would not oscillate. Amplifiers are lateral. Amplifiers to back up and _____ line more. Could possibly jack up FL or two. Would have to be non-lateral amplifier. The amplifier would have to be just the opposite.

25X1 [redacted] - Pre amplifier would divide.

[redacted] - Fall off works inter_____ begin to blank. Do you feel that all of this is due to photo multipliers.

to that and other amplifier.

25X1 [redacted] - Original design considered that it would be too _____ to make _____ for these pictures - photo multipliers were too complex - out of the scope of the system.

25X1 [redacted] - Do you think of this _____ standard to make the testing _____ 30:1. Felt that it is capable to do this in that they were _____ part that the control lever, part design line in _____

25X1 [redacted] - ask in order to be demonstratable in a professional sense - must work simultanously. Obviously what is thought of as maintaining the compression of the illumination in the birght area and meeting or increasing illumination in the dark areas. Fall off directly correlated in two - light in the light areas diminishes.

25X1 [redacted] - We are trying to _____for the raster. If the operational _____ is _____. For example if he has an area in the film the he is looking for detail. Size his raster down and brighten dark areas.

25X1 [redacted] - Can't go along with you. Doub _____ for people. Must be able to do this to a significant degree as opposed to the subtle perofrmance level. It is _____ in design.Has an effect of cutting off on future development of this proposal. to more _____ and satisfactory design. Also diminishes the worth of this equipment. Bring to effectless (effortless) that is _____ performance level. Jeopardize the future of the technique.

25X1 [redacted] Without running a full scale test this is good enough. Could do it with the feed back system or non feed back system that [redacted] is developing. as this system is set up would delay it - scope down.

25X1

25X1 [redacted] - May be applicable here at the photo interpreter(?) sense.

25X1 [redacted] Trying to express an opinion as to what is demonstratable. I don't have any support of an affect that is prominent enough. Trying to establish some levels that this particular development would be demonstratable to people that would be professional. If you feel that this is not reasonable we can't make a go ot it. I need from you what you anticipate these properties to be.

25X1 [redacted] As said before - somewhat better could be achieved but would cost more money. There is a limit on this end. On How far you are willing to go regarding formal information here. R&D contract here is what we are doing. what is the gain you will accept. Go through computations using compression is measuring. How far down should we be on this curve before we start bearing off this line?

25X1 [redacted] - Curves intersect as you shave shown there. [redacted] are successful in getting 3 FL _____. Increment (Increasing) brightness 25%. The other avenue would be eventually open is kinescope with higher brightness so that the intermission scan woul be _____ out.

25X1 [redacted] We are not interested in going to more money. The requirement in this area. should relate proposal cost to performance you can describe.

25X1 [redacted] - This change you are calling for would be small increase in performance for a lot of cost.

25X1 [redacted] - We are on the fence - cost and performance anticipated. Asking for an affect that is identifiable and present on is too subtle. System of describing the 33:1 not case of on and off. Do not regard this as relatable to operational conditions. Would like to see the performance with the feed back circuit on. Should not complete optical _____ of the photo multiplier.

25X1 [redacted] do not know because graphs curved up.

25X1 [redacted] Turn circuit off to demonstrate how ~~xxx~~ under dense material wave drives the _____ to the same level.

25X1 [redacted] difference in intensity at both points.

25X1 [redacted] operation/testing to shwo that the system is ~~xxxxxx~~ capable of 30:1 with feedback circuit on and the high light circuit to 6 F.L. measuring _____.

25X1 [redacted] - Define the performance you are going to be able to deliver. With diffusers in place and without diffusers in place.

25X1 [redacted] Also we check for _____meter with diffuser in place in direct viewing. 100 lines is somewhat _____with microscope.

25X1 [redacted] Would like you to define the limiting aspects of the system

25X1 [redacted] - Talk about more detailed report then we have intended to give to you.

25X1 [redacted] - I am relaying this information to you informally. If you feel that we are unreasonable say so.

25X1 [redacted] - Somewhat different than what we expected.

25X1 [redacted] - Cost level is different ~~xxx~~ than what we contracted for.

25X1 [redacted] - Ask that the performance be described as I suggested with diffuser in place, with the different rasters. x~~xxxx~~x/2" X 2" if viewed with direct microscope without the diffusers. [redacted] 25X1

25X1 [redacted] - should be defined in terms of minimum and maximum brightness of source of illumination with ~~xxxxx~~ feedback on with the absence of visible noise and visible flicker. Attendant figures for each of the raster sizes.

25X1 [redacted] - Try to get a raster that 100 F.L. we lessen in this direction --- should it attenuate brightness when you get to 300 to 1000.

25X1 [redacted] ~~xxx~~ When we say 100 (kinescope) we can deliberately hold

the kinescope back.

25X1 [redacted] - You may want to define the noise level with the _____ study _____not with the brightness of the top is _____.

Prefer to have a statement that is won't be visible. If you prefer to state it what you are going to deliver.

25X1 [redacted] - Must know the flicker to _____ size.

- Relationship of the ambient illumination both incoherent and structured.

25X1 [redacted] Explain that these fluctuations used with 40 W light bulb.

- Box screen of observable [redacted] would like to have some distinction of this non-uniformity. Would like to have some distinction of this non-uniformity. Would like to have it eliminated.

Basically means that [redacted] termanals (?) of the raster [redacted] are without image specs.

[redacted]

25X1 [redacted] - Explain alteration in specs.

Would like spot size design. Would like to know the range of the _____ without the diffuser in place.

25X1 [redacted] You don't want it on the large raster.

- With diffuser would specifically like to know performance at the level of the diffuser not at _____.

See the mask _____ at the possible leak(?) through the diffuser.

The diffuser has to disperse the illumination [redacted] adequately that we cannot see the mask down at the _____level.

Noice at 30:1 ratio. No visible flicker

25X1 [redacted] No light [redacted] showed through the diffuser

25X1 [redacted] - Light projection should be slowed __________. You are this. You have to look at it very carefully.

25X1 [redacted] - The microscope definition of lock support and modification of the __________ scope .

25X1 [redacted]

25X1 [redacted] - that of delivery comming up - what will be the ~~modifica~~ condition be on the __________________________ . Left position - in the way when not in use. Aske that this would be modified.

25X1 [redacted] - fold up.

- fold up so that it does not encroach on the work space.

Desirability of contral ~~channel~~ channel - manual (?) (position)

25X1 [redacted] - you could interpret the film until you push the board.

- Discuss the CRT tube life.

25X1 [redacted] - Cannot give you this with current tube.

- Life of 1000 F.L. - No such data around/and ~~an~~ life time evaluation means time.

25X1 [redacted] - Let ~~is~~ us know what kind of statement you can give us. Skeptical about this since you have already run into problems.

25X1 [redacted] - Statement of level of effort of what you intend to do to ~~gate~~ ~~gather~~ gain a brighter illumination.

25X1 [redacted] should be based as a block. ~~MxxxNewxxxxIxxx~~

25X1 [redacted] I think it should. I want to remind you [illegible] statement

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commitment
will be evaluated in terms of control (?) statement A 12 of this problem here. Certainly would look at the entire system in the light of that commitment. We suggest that you have a touch identifyable control system.

25X1 [redacted] Knobes should be different, so that it can be operated in the dark.

25X1 [redacted] Encountered difficulty with the noise level. If you take issue with the noise for performance grainularity are reasonable use they would add to the noise level.

25X1 [redacted] For different levels of performance you would like to have different cost gratings.

25X1 [redacted] Delivery schedule should be provided and the _____ relationship of the second viewer should be available.

On the subject of transmission performance graphs -- request that these graphs be prepared for a brightness level of 300 F.L. to 1000 F.L. direct viewing with diffuser --- without diffuser, with microscope.

25X1 [redacted] You have gone over many points rather rapidly ---- can we adequately report to you.

25X1 [redacted] I am the only person who is in favor of it. The more channels I have to go through the more time it takes. It would have to be submitted to someone of higher authority.

25X1 [redacted] I would like to know when we can finish it. We would like to know if we can do this work within a short period of time. Puts us in an awkward

25X1 positon.

[redacted] What kind of lead time are we talking about until we get the additional authorization.

25X1 [redacted] - it appear that it would have to come out of this years funding. It is not available without higher approval. [redacted] minimum of one month. 25X1

25X1 [redacted] Who will evaluate the equipment.

25X1 [redacted] - could use their evaluation as far as operational dependability. We are hoping to try and supply the operational ----------

25X1 [redacted] You are talking about the final breadboard. Particularly to give guidence.

25X1 [redacted] is being very bold because you were not in on the original negotiations. We will await performance schedules. We would not have ordered two of these items instead of one if we have not been assured of the level of performance.

25X1 [redacted] - I don't deny that we expressed confidence in the objectives. Any time you go beyond state-of-the-art on a new piece of equipment it is ---------- a pretty much of a development problem. We ran into many problems which directly pertain to the mechanical design. We encountered difficulties which were not anticipated. We arejust as unhappy about these deficiencies as you are. We would not have taken it on a fixed price basis for these reasons.

25X1 [redacted]

if we had gone into it with this in mind. (speaking about operational PI's) If you show this to him the effect is not great enough for him.

25X1 [redacted] Have interpreters looked at this?

25X1 [redacted] - I have worked with R&D problems a long while and I know that operational people will not accept this.

25X1 [redacted] - Would like to see some of these people.

25X1 [redacted] 1000 F.L. phosphor could be recognized - you know this to be true - but operational people would look at it and say there is not enough light.

25X1 [redacted] - We are not trying to get the operational people to accept it.

25X1 [redacted] to develop continuity - wouldn't a longer time help.

One of the things that this diffuser was to do was that/it could work on it and deliver what modifications would be needed.

25X1 [redacted]- we felt that it would give us a dramatic performance.

30: 1

automatic focusing (viewer) in terms of what your technical representative said was feasible on a closed loop system.

25X1 [redacted]- With the measurements and ratios (?) and any documentation you can give us by the end of the week.

25X1 [redacted] Management will take a dim view of this. Can you give us any kind of line on dollars.

25X1 [redacted] level includes the old contract costs. We attempted to review your proposed specifications - need more definition of the parameters. We are only asking for more definition of these _____. We don't expect that it will go above the previous standards _____.

25X1 [redacted] High intensity loop a different section?

[redacted]- performance that you describe to us in your proposal/and what we saw at your facility on our last visit are not the same. I also agree that we accepted your test procedure.

25X1 [redacted] Hinges on several of the --------

would it be beneficial to increase it from three to five?